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**REMARKS**

Applicant has added or revised claims to define the invention more particularly and distinctly so as to overcome the technical rejections and define the invention patentably over the prior art. Additionally, Applicant believes there is patentable merit in some claims rejected in the prior Office Action, and responds as follows:

**The Claims Rejection Under 35 U.S.C. 102(e)**

The O.A. rejected Claims 1 and 6 as being anticipated by Alexandrov, Patent No. 6,809,483.

Applicant requests reconsideration of this rejection for the following reasons:

The O.A. cited Alexandrov Column 1, lines 8-11, and Column 3, lines 32-59 as implying that Alexandrov's arc detection method is based on high frequency noise detection. However, Alexandrov cites that fluorescent lamps in related art are driven by "high frequency" (Col. 1, lines 16-18). This implies that his definition of "high frequency" is a characteristic of normal operation.

Applicant notes that in Col 3, lines 5-8, Alexandrov's further use of the phrase "low frequency amplitude modulation of the ballast output voltage" implies that detection of a modulating frequency lower than the fundamental is his principle for arc detection. This view is further strengthened by Alexandrov's statement "An advanced arc detection and shutdown circuit illustrated in Fig. 4 comprises a low pass notch filter..." (Col. 3, lines 60-61)

In contrast, Applicant uses frequency content above the fundamental frequency to initiate ballast shutdown.

Applicant further observes that Alexandrov Column 3, lines 32-59 refers to a low pass filter for use in Alexandrov's arc detection technique, and no mention is made of a high

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pass filter which is part of Applicant's circuit. Therefore Alexandrov doesn't anticipate either of Claims 1 or 6.

A further advantage of Applicant's circuit is the ability to detect load open or short conditions, not present in the Alexandrov disclosure, and unobvious therefrom.

### **The Claims Rejection Under 35 U.S.C. 103**

Claim 4. (OA p. 6) Examiner cites Alexandrov in view of Jayaraman as making obvious the use of an isolation transformer as the sense element. However, Applicant's design differs by disposing the isolation transformer secondary in series with the switching element output. Applicant's design achieves additional results not mentioned in either prior art reference whether singly or through combination.

Applicant's placement of the sense transformer in series with the switch element produces the additional advantage of shutting down the ballast in case of lamp open circuit. In the absence of AC current through the sense transformer primary, showing a load open condition, Applicant's design will cause shutdown. Further, because a minimum amount of harmonic frequency energy is required to maintain ballast operation, the case of load short circuit also shuts down the ballast, because the harmonics due to lamp presence are not detected.

These unique features are not obvious from combining the Alexandrov and Jayaraman references. Applicant uses the inherent MOSFET body diode in a unique way, which is reflected in new claim 25.

Claim 5. (OA p. 5) Examiner alleges that Applicant's use of an optoisolator in an alternative embodiment is obvious from Alexandrov in view of Sun. Applicant notes the Sun shutdown circuit (5,574,335 Fig. 2) apparently activates the optoisolator when C14 charges above the threshold voltage of switch element D2, further activating triac TR1 to

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shut down the ballast. Therefore, Sun's use of the optoisolator as an on-off element to relay a signal from the sense element is unlike Applicant's use.

In an alternative perspective, Applicant (Figure 7) uses the optoisolator input LED effectively in parallel with the lamp to sense lamp drive frequency. The optoisolator is therefore an input stage to the depicted high pass filter and amplifier along with the following Schmitt trigger, as output stage. These latter elements condition the raw lamp sense signal from the optoisolator and "make the decision" to shut down the ballast.

In other words, Sun uses the optoisolator in a post-processing mode to shut down the ballast after the "decision" was made to shut down, by his detection circuit comprising C14, D2, etc.

In contrast, Applicant uses the optoisolator in a pre-processing mode to gather raw sense information that is subsequently "decided upon" by the signal conditioner and threshold detector. Therefore, Applicant submits his use of the optoisolator is not obvious in view of Sun.

Claim 6 revisited. A Section 102 rejection was made of disabling the sensing circuit based on Alexandrov. Applicant maintains, as with defending the novelty of Claim 1, that by use of high frequency detection, the arc detection in the instant invention is not the same as that of Alexandrov. Therefore, there is no literal anticipation by Alexandrov of Applicant's dependent claim 6.

Further, Applicant's use of the extra capacitor to temporarily disable the sensing circuit provides an advantage not found in Alexandrov. Applicant observes that startup sense disable in Alexandrov is through passive components C27 and C29, which are part of his load waveform lowpass filter circuit. In contrast, Applicant's C9 is a separately added capacitor that introduces a timing constant separate from the load frequency filtering.

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As a corollary, it should be noted that changing C27 and C29 in Alexandrov's circuit would change the filter time constants, which should be established separately from the initial desense time. By Applicant's use of C9, the initial desense time is essentially decoupled from the filter time constants, thus providing an additional advantage.

Claim 9. As discussed in Applicant's response for Claim 4, Applicant's use of a sense transformer in series with the shutdown switch output is novel. This is reflected in new claim 25 and dependent claims therefrom.

Claims 10 and 19. Examiner's rejection of claims say that the "PLL-LPF arrangement as taught by Szepsi... would allow a generation of driving signal that is phase adjusted for optimum switching performance, thereby adjusting any output frequency to the load" (OA p. 11, first paragraph). This is not at all how Applicant proposes to apply the PLL in his abnormality detection circuit.

Applicant would apply the PLL to detect the oscillator circuit frequency, rather than to modify it. In Applicant's proposed technique, the VCO control loop voltage is to be monitored to detect a frequency excursion above the normal operation range, with following stage circuitry creating a shut down signal based on abnormality detection.

In summary, Szepsi uses a PLL to control inverter frequency, Applicant would use one to sense the frequency.

Prior Claims 11 and 14 are combined in new Claim 11 to show the patentable novelty of an additional desense delay element and Applicant submits this is patentable over the combination of Alexandrov and Holmquest references.

Claim 21. As explained in the response to the Claim 5 rejection, Applicant would apply the optoisolator in a way different from Sun, by applying it within frequency sense

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detection circuitry (the signal would be pulsed DC), rather than as the shutdown control switch (the signal would be a step function).

Claim 22. As discussed in the response to the Claim 6 and 14 rejections, the addition of circuitry to have a different time constant from the shutdown sense filter circuit is novel.

Applicant and assignee have indicated their intention to file a change of correspondence address for this application. In the meantime, to expedite prosecution, questions may be directed to the undersigned agent by telephone, facsimile, or email.

Respectfully submitted,

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